

Colloquium

Modelling Deep Ocean Currents

By

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Day: Thursday, October 6th, 2005

Time: 3:30pm

Location: CAB 265

Refreshments will be served in CAB 649 at 3:00pm.

On the planetary-scale, Earth's ocean circulation is comprised of the surface-intensified wind-driven currents that transport warm equatorial waters toward the polar regions, and the abyssal density-driven currents that transport cooler polar waters back toward the equator. Together, these two current systems describe the large-scale convective overturning of the oceans. The stability and time evolution of this global circulation pattern is critical in understanding climate variability and change. Perhaps surprisingly, the present generation of the most sophisticated numerical ocean climate models does not adequately describe the observed structure of the abyssal currents.

This overview talk, which will begin at a very introductory level and remain accessible to all, will describe efforts to develop a theory for the initiation and maintenance of these abyssal ocean currents. Various themes in modern applied mathematics will be touched on, including physical mathematical modelling, asymptotic reduction, computational fluid dynamics, Hamiltonian PDEs and hydrodynamic stability theory.